

Pedometers may not provide a positive effect on walking activity

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Introduction

Electronic pedometers are gaining credibility as a reliable method for objectively measuring physical activity.^{1,2} The feedback from a pedometer is immediate and objective, providing an unbiased measure of physical activity to the individual. Previous research has shown that objective feedback has a positive effect on adherence.³ Other authors have suggested that a pedometer may be used as a motivational tool to enhance adherence to exercise programs.^{1,2} However, there is little evidence in the literature that this possibility has been investigated and measured.

This study investigated the effect of feedback from a pedometer as an intervention strategy to increase adherence to a walking program. When used in a walking program that specifies a daily step count, a pedometer offers frequent and immediate feedback (positive and negative) on performance. Regular feedback on performance is likely to increase the likelihood of adherence to a walking program.^{4,5}

Methods

Thirty-three participants were recruited into the study. They were: not already exercising 3 x 30 minutes per week, not hypertensive, 45-65 years of age, and physically able to walk unaided for 30 minutes continuously. Baseline walking activity was assessed before the walking program began by asking all participants to wear an individually calibrated pedometer, with the step count display obscured, during all waking hours for one week. Ranked total weekly step count was then used to randomly allocate the participants into two matched groups: the control group (Walk) or treatment group (Walk & Feedback). The W group was given its pedometers back with the step count display obscured. The WF group was given normal pedometers and was shown how to access the step count display.

A modified version of the National Heart Foundation's 'Just Walk It' walking program was promoted to the participants. This information included the risks of being inactive, the potential

Abstract

Issue addressed: Several national campaigns promote walking and the use of a pedometer to monitor walking activity. It is assumed that wearing a pedometer has a positive effect on walking activity and the likelihood of attaining walking goals. There is no direct research evidence that feedback from pedometers has a positive effect on walking activity. The purpose of this pilot project was to examine the efficacy of feedback from a pedometer as an intervention to increase adherence to a walking program.

Methods: Thirty-three participants aged 45 to 65 years volunteered to participate in a four-week walking program. The participants were given a daily target for walking duration and step count. The W (Walk) group wore pedometers that had their step count display obscured, while the WF (Walk & Feedback) group were taught how to use the display.

Results: There was no significant difference in adherence (measured as step count) between the groups during the first two weeks or the second two weeks of the walking program, although self-assessed walking activity two weeks after the end of the program indicated that adherence may have been higher in the WF group. The participants' knowledge that their walking activity was being monitored may have had an important effect on their walking activity.

Conclusion: Pedometer feedback had no influence on the amount of walking completed by the WF group.

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So what?

These preliminary results suggest that pedometers may not necessarily have any positive effect on the walking activity of participants in a walking program.

benefits of becoming more active, and suggestions on how to fit walking into daily life. Both groups were given the goal of walking for 30 minutes on all or most days of the week for the first two weeks, and to increase this to 40 minutes during the second two weeks. This target was also expressed as a step count (3,000 and 4,000 steps) for the WF group. Total step count for each fortnight was compared between groups to determine the effect of pedometer feedback.

Interviews were conducted with a sample of the participants after the completion of this walking program in an attempt to identify some of the motives or disincentives to walk. In addition, two weeks after the end of the program, participants completed a questionnaire to determine how their walking activity had changed.

Results

The average age (52 ± 1.21 years), gender distribution (female $n=28$, male $n=5$) and baseline step count was not different for each group ($p < 0.05$). The average baseline daily step count ($7,334 \pm 3,151$) was calculated from the weekly count and was typical of a sedentary population.^{6,7} Step count for both groups increased significantly ($p < 0.001$) from the first two weeks to the second two weeks as required by the targets set by the investigators (see Table 1). However, there was no significant difference between the groups for step count in either fortnight ($p = 0.887$).

Adherence was calculated as the percentage of participants in each group who met the target step count in each fortnight. Adherence rates decreased over time, suggesting motivation to keep walking had decreased (see Figure 1). The results from the two-week follow-up questionnaire suggested that there was a trend towards this decline being less in the WF group, but this was not significant.

The participants who were interviewed reported a high level of motivation to walk every day throughout the study. The most

commonly reported reasons for this motivation included wanting to experience health benefits, wanting to get into the routine of regular walking, and keeping the commitment of being enrolled in the program. Reasons given for feeling unmotivated on certain days, or missing the day's walk, were tiredness, bad weather and time restraints (e.g. busy with work). The answers reported by the WF and W group were not considerably different.

Discussion

The adherence rates in both groups showed a decline over time that is typical of similar studies.^{4,5} It was hypothesised that the feedback from the pedometer would lead to a higher step count in the WF group compared with the W group. However, this pilot study does not provide any clear evidence that pedometers offer a positive effect on the walking activity of participants in a walking program. This may be due to the small number of participants and short duration of the walking program. The interviews revealed that the participants believed that their walking activity was being monitored closely, despite our attempts to distract them from this fact. It is assumed that this belief had a positive effect on the walking activity of both groups, which masked any effect of the pedometer feedback (i.e. the Hawthorne effect⁸). While this effect confounded the results, it could be exploited to achieve high adherence rates in programs that promote physical activity.

Conclusions

The usefulness of pedometers should be examined more closely. The limitations of the present study do not necessarily undermine the rationale for the use of pedometer feedback as an intervention to increase adherence to a walking program. Any further attempts to answer the present research question should achieve greater statistical power by recruiting a larger group over a longer period of time. Close monitoring of behaviour change may prove to be an effective but expensive strategy.

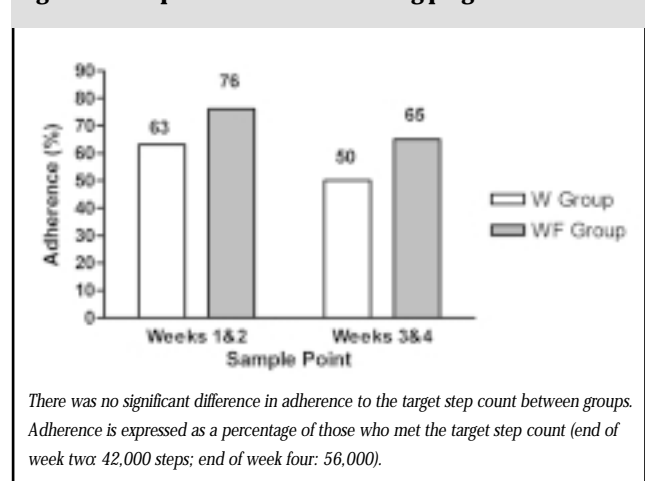
Table 1: Total weekly step count before and during the walking program.

	Walking group (n=16)	Walking-feedback group (n=17)
Baseline step count during all waking hours (\pmSD)	51,358 ($\pm 5,523$)	51,325 ($\pm 5,505$)
Step count during the walking program		
Weeks 1&2 (\pmSD)	46,760 ($\pm 5,466$)	47,479 ($\pm 2,292$)
Weeks 3&4 (\pmSD)	53,666 ($\pm 6,543$) ^a	56,396 ($\pm 3,315$) ^a
Total	100,425 ($\pm 23,474$)	103,874 ($\pm 13,469$)

(a) Indicates a significant difference to step count in weeks 1&2, within the same group.

The groups were well matched for baseline step count, there was a significant increase in step count from weeks 1&2 to 3&4, but there was no difference between groups. Baseline step count is the total over one week, walking program step count is the total over two weeks.

Figure 1: Group adherence to the walking program.



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